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UNITED STATES PATENT APPLICATION

OF

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FOR

METHOD AND SYSTEM FOR THE WIRELESS DELIVERY OF IMAGES

METHOD AND SYSTEM FOR THE WIRELESS DELIVERY OF IMAGES

RELATED APPLICATION

Under provisions of 35 U.S.C. § 119(e), the Applicants claim the benefit of U.S. provisional application No. 60/234,011, filed September 20, 2000, which is incorporated herein by reference.

TECHNICAL FIELD

The present invention relates generally to systems and methods for the wireless delivery of images. More particularly, the present invention relates to systems and methods, including software, for sending graphical images through a network, such as the Internet, to an end-use-device, such as a pager or PDA device. The invention also relates to software in the end-use-device for converting the data received to a format usable by the end-use-device.

BACKGROUND OF THE INVENTION

The need to quickly and efficiently communicate an image to a remote individual has become a common need for many organizations as well as individuals today. For example, a law enforcement entity may wish to send a photographic image of a suspected criminal to another law enforcement entity or a law enforcement officer in the field. One plausible way at present for accomplishing this task, is to digitize the desired image into an image file, attach the image to an e-mail and send the e-mail along with the image file to the recipient. Perhaps another way to transmit the image is to photocopy the photograph and fax the image between the law enforcement entities.

With the ultimate goal of getting the image to the law enforcement officers in the field, present technologies requiring undesirably large bulky desktop equipment may require the officer to leave the field in order to receive the image. Requiring the officer to leave the field to obtain image data consumes time and uses the officer's time to complete tasks, which are not at the core of the law enforcement function. Thus,

sending of an image to an officer in the field becomes a time-consuming and laborious task.

One approach to the problem is described in U.S. Patent No. 6,101,548 to *Okada*. In this patent, a communications terminal device such as a facsimile device is employed with a function of transmitting original document image data to a destination by electronic mail. Before image data transmission to a destination by electronic mail, a main controller of the facsimile device converts the image data on one page of the original document to electronic mail data and determines how much volume the image data has. The image data on one page of the original document is transmitted to a destination by a single electronic mail when the calculation result does not exceed a prescribed volume. On the other hand, the original image on one page of the original document is divided up into smaller pieces of data and transmitted to a destination by a plurality of electronic mails respectively when the calculation result exceeds a prescribed volume.

Another approach to the problem is described in U.S. Patent No. 6,076,109 to *Kikinis*. In this patent, a system is provided wherein relatively low-end computers, such as portable, battery-powered computers ordinarily incapable of sophisticated Internet browsing functions, may be used to browse the Internet. The enhanced computing ability for such portables is provided by a unique Internet server adapted for transposing data files to alternative, low information-density form, preferably comprising simplified or single files suitable for rapid processing and display by connected portable and other low-end computers. In embodiments wherein battery-powered field units are used, battery life is exhibited far beyond what would be expected for a battery-powered computer with computing power for browsing the Internet directly. In some embodiments of the invention, adapted files are saved and identified for future use in communicating with specific devices over Internet connections.

Neither of the aforementioned patents disclose reconstruction by a portable end-use device of multiple e-mail files containing an image. Also, neither disclose the conversion of the image data by a portable end-use-device into a format displayable by the end-use-device. And finally, none of the aforementioned patents disclose converting the image to text data, breaking the text data into separate e-mail messages

based upon the maximum e-mail size receivable by the end-use-device, and sending the image to the end-use-device over two separate paths.

Therefore, there remains a need in the art for a fast, simple, and flexible way to transmit images to remote individuals who do not have access to conventional desktop equipment. There is also a need in the art for receipt of image data using available remote devices such as pagers and the like.

SUMMARY OF THE INVENTION

In accordance with the current invention, a wireless image delivery system and method are provided that avoid the problems associated with prior art delivery systems as discussed herein above.

In one aspect, a method for transmitting an image consistent with the invention includes receiving image data in a first file format at a first server. Once the image data is received, the method also includes converting the image data to a plurality of image files in a second file format with each one of the plurality of image files limited to a specified file size. And finally, the method includes transferring the plurality of image files to a second server over a first path and then sending the plurality of image files from the second server to an end-use-device over a second path. The end-use-device is not capable of receiving files over the first path and is limited to receiving files of a size less than or equal to the specified size.

In another aspect, a method for transmitting an image consistent with the invention includes converting at a user computer the image data in a first file format to a plurality of image files in a second file format. Each one of the plurality of image files is limited to a specified file size. Next the method includes transferring the plurality of image files to a second server over a first path and then sending the plurality of image files from the second server to an end-use-device over a second path. The end-use-device is not capable of receiving files over the first path and is limited to receiving files of a size less than or equal to the specified size.

In yet another aspect, a system for transmitting an image consistent with the invention includes a first server configured to receive image data in a first file format

and convert the image data to a plurality of image files in a second file format. Each one of the plurality of image files is limited to a specified file size. The system also includes a second server in communications with the first server via a first path. This second server is configured to receive the plurality of image files over a first path and to send the plurality of image files from the second server over a second path.

In yet another aspect, a system for transmitting an image consistent with the invention includes a user computer configured to convert image data in a first file format to a plurality of image files in a second file format. Each one of the plurality of image files is limited to a specified file size. The system also includes a second server in communications with the user computer via a first path. The second server is configured to receive the plurality of image files over a first path and to send the plurality of image files from the second server over a second path.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are intended to provide further explanation of the invention as claimed. The following description, as well as the practice of the invention, set forth and suggest additional advantages and purposes of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate several embodiments of the invention and together with the description, serve to explain the principles of the invention.

FIG. 1 is a functional block diagram of a system in an exemplary operating environment for an exemplary embodiment of the invention;

FIG. 2 is a flow chart that illustrates the general operation of an exemplary embodiment of the present invention;

FIG. 3A is a flow chart that illustrates the user uploading the image file, image details and recipient end-use-device data to the first server via a web page;

FIG. 3B is a flow chart that illustrates the user uploading the image file, image details and recipient end-use-device data to the first server via e-mail;

FIG. 4 is a flow chart that illustrates the first server converting and breaking the data into blocks, and then sending the blocks as parts of multiple e-mails to the second server;

FIG. 5 is a flow chart that illustrates the second server sending the multiple e-mails to the end-use-device over the wireless network;

FIG. 6 is a flow chart that illustrates the end-use-device converting the e-mails into the image and displaying the image;

FIG. 7 is a screen shot illustrating the image delivery start page;

FIG. 8 is a screen shot illustrating the login window of the image delivery start page;

FIG. 9 is a screen shot illustrating the image entry page;

FIG. 10 is a screen shot illustrating the e-mail message containing the data from the image entry page;

FIG. 11 is a screen shot illustrating the details text file containing the data from the image entry page;

FIG. 12 is a screen shot illustrating the raw UUencoded file containing the data from the image entry page UUencoded;

FIG. 13 is a screen shot illustrating the modified UUencoded file containing the data from the image entry page UUencoded;

FIG. 14 is a screen shot illustrating the Motorola PAGEWRITER 2000X utilized in the exemplary embodiment of the present invention;

FIG. 15 is a screen shot of the Motorola PAGEWRITER 2000X illustrating the incoming image received prompt;

FIG. 16 is a screen shot of the Motorola PAGEWRITER 2000X illustrating the percentage of the image left to reconstruct;

FIG. 17 is a screen shot of the Motorola PAGEWRITER 2000X illustrating display image received prompt;

FIG. 18 is a functional block diagram of a system in an exemplary operating environment for an alternative embodiment of the invention;

FIG. 19 is a flow chart that illustrates the general operation of an alternative embodiment of the present invention;

FIG. 20 is a flow chart that illustrates the receiving of e-mail messages by the second server and sending of the emails to the end-use-device; and

FIG. 21 is a flow chart that illustrates the receiving of e-mail messages by the end-use-device, converting them and then displaying them.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made to various embodiments according to this invention, examples of which are shown in the accompanying drawings and will be obvious from the description of the invention. In the drawings, the same reference numbers represent the same or similar elements in the different drawings whenever possible.

Broadly stated, the invention is a system and method, including software, for sending graphical images through a network, such as the Internet, to an end-use-device, such as a pager or PDA device. The invention also provides software in the end-use-device for converting the data received to a format usable by the end-use-device.

Referring to Fig. 1, an embodiment of the present invention provides for the sending of image data **115** along with image details **120** from a user computer **105** to an end-use-device **188** designated by recipient end-use-device data **125**. The embodiment of present invention comprises the user computer **105** operated by a user **102**, a first server **130**, a second server **160** and the end-use-device **188** operated by an end-use-device user **190**. The first server **130** comprises a first server front end **135** with its associated first server front end database **140**, a first server back end **150** with its associated first server back end database **155**, and an SMTP server **170**. The first server front end **135** is separated from the first server back end **150** by a first server firewall **145**. The function of the first server front end **135** is to provide a web interface via the Internet **110** between the user computer **105** and the first server **130**. The function of the SMTP server **170** is to provide an e-mail interface via the Internet **110** between the user computer **105** and the first server **130**. The function of the second server **160** is to provide an interface to the wireless network **187**.

The first server front end **135** is preferably implemented on a Compaq Proliant 1600 server running Windows 2000 and Domino Webserver. The first Server back end **150** is preferably implemented on a Compaq Proliant 1600 server running NT4 and Domino Application Server. And the SMTP server **170** is preferably implemented on a Compaq DL 360 running Windows 2000 and Domino SMTP Mail Server.

An example operation of the invention is the situation in which a law enforcement agency wishes to send an officer a pictorial image of a particular individual suspected of a crime. In this case, the image along with the address of the officer's pager would be uploaded from the law enforcement agency to a secured Internet server. At the server, the image data is converted to an ASCII format, placed in the body of an e-mail or e-mails and sent to a server operated by a wireless network provider. From the server operated by the wireless network provider, the e-mail or e-mails are sent to the officer's pager over a wireless network.

The officer's pager receives the e-mail, converts the data to a displayable format and then displays the image onto the screen of the pager. Software located on the pager must receive the e-mail, determine that the body contains image data, and convert the image data from the ASCII format to the displayable format used by the pager. Also, if the image is large, it may become necessary to receive the data for one image in two or more separate e-mail bodies. In this case the software must be able to merge the data from the e-mails received into one image.

Overview of the Preferred Method

Fig. 2 is a flow chart setting forth the general steps involved in an exemplary method **200** for the wireless delivery of an image. The implementation of the steps of method **200** in accordance with an exemplary embodiment of the present invention will be described in greater detail in FIG. 3A through FIG. 6.

Exemplary method **200** begins at starting block **205** and proceeds to decision block **207** where it is determined if the user **102** wants to upload using a web page. If it is determined at decision block **207** that the user **102** wants to upload using a web page, method **200** advances to subroutine **210** where the user **102** uploads the image data **115**, image details **120** and recipient end-use-device data **125** to the first server

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130 via a web page. The steps comprising subroutine **210** are shown in FIG. 3A and will be described in greater detail below. If it is determined at decision block **207**, however, that the user **102** does not want to upload using a web page, method **200** advances to subroutine **210'** where the user **102** uploads the image data **115**, image details **120** and recipient end-use-device data **125** to the first server **130** via a e-mail. The steps comprising subroutine **210'** are shown in FIG. 3B and will be described in greater detail below.

Next, the method proceeds to subroutine **220** where the first server **130** converts and breaks the data into blocks, and then sends the blocks as multiple e-mails to the second server **160**. The steps of subroutine **220** are shown in FIG. 4 and will be described in greater detail below. The method continues to subroutine **230** where the second server **160** sends the multiple e-mails to the end-use-device **188** over the wireless network **187**. The steps of subroutine **230** are shown in FIG. 5 and will be described in greater detail below.

Exemplary method **200** continues to subroutine **240,** where the end-use-device **188** converts the e-mails into the image and displays the image. The steps of subroutine **240** are shown in FIG. 6 and will be described in greater detail below. From subroutine **240,** exemplary method **200** ends at step **250**.

Image and Data Uploaded to the First Server Via a Web Page

Turning now to FIG. 3, describing the exemplary subroutine **210** from FIG. 2 in which the user **102** uploads the image data **115**, image details **120** and recipient end-use-device data **125** to the first server **130**. Subroutine **210** begins at starting block **305** and advances to step **310** where the user **102** connects to the Internet **110** via a standard internet browser.

Preferred methods of the present invention utilize a user computer **105**, which is typically a personal computer or other similar microcomputer-based workstation. However, those skilled in the art will appreciate that user computer **105** may comprise any type of computer operating environment such as hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, minicomputers, mainframe computers, and the like. User computer **105** may also be

practiced in distributed computing environments where tasks are performed by remote processing devices. User computer **105** has the capability of connecting to the Internet **110**, generally through the use of a standard web browser type software package such as Microsoft Corporation's INTERNET EXPLORER™ or Netscape Communication Corporation's NAVIGATOR™ or COMMUNICATOR™ Internet browser computer programs. The user **102** typically connects the user computer **105** to the Internet **110** through an Internet service provider (ISP) (not shown), in the manner as is known to those skilled in the art.

Once the user **102** has connected to the Internet **110** through the user computer **105** in step **310**, subroutine **210** continues to step **315** where the user **102** points the web browser to the Internet home page address or Uniform Resource Locator (URL) of the first server front end **135**. The first server front end **135** is associated with the first server **130** constructed in accordance with the invention. The function of the first server front end **135** is to provide an Internet interface between the user computer **105** and the first server **130**. As will be known to those skilled in the art, a "web front end" is a computer system that receives hypertext transfer protocol (http) requests from a web browser computer program directed to a specific URL, and provides responses to the requesting computer system that, when processed by the web browser computer program, displays a page of the Internet web site associated with the URL. For example, an exemplary URL employed for the present invention at the time of filing this patent application is "http://www.choicepoint.net/polly". Directing an Internet-connected computer system with an operative Internet web browser program at this URL causes display of the home page associated with this web site on the computer's display. Such operations are well known to those skilled in the art and will not be discussed further herein.

Once the user **102** points the web browser to the Internet home page address of the image delivery start page **705** at www.choicepoint.net/polly as shown in FIG. 7, the subroutine **210** advances to step **320** where the user **102** logs into the first server front end **135**. To initiate the login process, the user **102** clicks the login button **710** of FIG. 7. Once the login button **710** is clicked, the login window **805** as shown in FIG. 8 appears. At the login window **805** the user enters a unique username **810**, password

815, and clicks the "OK" button **820** in order to obtain access to the image entry page **905** as shown in FIG. 9.

After the user **102** logs into the first server front end **135** in step **320**, subroutine **210** advances to step **325** where the user **102** designates the image data **115** for uploading. Each image entry page **905** as shown in FIG. 9 is labeled with a unique tracking id **910** to be used throughout the process. The site is preferably coded in hyper text mark-up language (HTML) and uses a Secure Sockets Layer (SSL) certificate for added protection and encryption during request transmission. Secure Sockets Layer (SSL) is a conventional security protocol on the Internet. When an SSL session is started, the server sends its public key to the browser, which the browser uses to send a randomly-generated private key back to the server in order to have a private key exchange for that session. Developed by Netscape Corporation, SSL has been merged with other protocols and authentication methods. SSL utilizes the public keys and private keys of the Public Key Cryptography method. Those skilled in the art will appreciate that Public Key Cryptography is a known method that uses a two-part key (code) that is made up of public and private components. To encrypt messages, the published public keys of the recipients are used. To decrypt the messages, the recipients use their unpublished private keys known only to them.

Still referring to FIG. 9, the image entry page **905** resides on the first server front end **135** existing outside of the first server firewall **145**. A firewall is generally a method for keeping a network secure. It can be implemented in a single router that filters out unwanted packets, or it may use a combination of technologies in routers and hosts. Firewalls are widely used to give users access to the Internet in a secure fashion as well as to separate a company's public Web server from its internal network. They are also used to keep internal network segments secure.

At this step, user **102** designates the image data **115** for uploading using the browse button **915** on the image entry page **905**. The file name of the image will appear in the image upload field **920**. The image data **115** can be in a variety of different file formats. For example, such formats and corresponding file extensions can comprise one of the following: tagged image file format (.tif), graphics interchange format (.gif), joint photographic experts group format (.jpg), and bit map format (.bmp).

However, embodiments of the present invention envision that any other file format for graphic images will suffice. The user **102** is able to preview the image corresponding to the image data **115** by clicking the preview button **925**. If the user **102** clicks the preview button **925**, the image is displayed with a height of 115 pixels. Once the image is displayed, the user **102** can remove and replace it as needed.

From step **325**, subroutine **210** advances to step **330** where the user **102** enters image details **120** into the image detail list **930** comprising designated fields on the image entry page **905** as shown in FIG. 9. Image details **120** in the present embodiment may include: suspect or victim, first name, last name, date of birth, hair color, place of birth, eye color, height, complexion, weight, sex, build, race, occupation(s), nationality, scars and marks, and comments. Those skilled in the art will appreciate that other details may accompany an image.

Many of these fields have drop-down selection lists with standard values while others are free-form text fields. For example, if the user **102** clicks on the hair color field, a list of various hair colors will appear. The user **102** need only click on the desired color to enter the data rather than typing a word into the field. If the desired color is not included in the drop-down list, the user **102** may enter the color by typing a word into the field. The user **102** optionally completes all fields in the image detail list **930**.

Once the user **102** enters image details **120** in step **330**, subroutine **210** advances from step **330** to decision block **335**. At decision block **335** it is determined if the user **102** wishes to send the image to selected recipient end-use-devices. If the user **102** wishes to send to selected recipient end-use-devices, subroutine **210** advances to step **340** where the user **102** enters recipient end-use-device data **125**. This is done by selecting recipient end-use-device users from a pre-filled drop-down list **935** as shown in FIG. 9. In this list, only the names of end-use-device users associated with the specific username **810** entered on the login window **805** as shown in FIG. 8 will appear. The user **102** may select multiple individual end-use-devices from this list. A list of all end-use-device users and their respective end-use-device numbers are stored in the first server front end database **140** on the first server front end **135** external to the first server firewall **145**. In order to update the first server front end database **140**,

replication between it and the identical internal first server back end database **155** located on the first server back end **150** within the first server firewall **145** typically occurs. Therefore, new end-use-device users subsequently added to the first server back end database **155** and will preferably not become active until it is replicated into the first server front end **135**. From step **340**, subroutine **210** advances to step **350**.

If at decision block **335** it was determined, however, that the user **102** does not wish to send the image to selected recipient end-use-devices, subroutine **210** advances to step **345.** At step **345** the user **102** enters recipient end-use-device data **125** as region data including the city and state of the broadcast as well as a radius from the city center establishing the broadcast limit. From step **345**, subroutine **210** advances to step **350**.

At step **350** of subroutine **210**, the user **102** initiate the data transmission by clicking the submit button **940** of FIG. 9. Clicking the submit button **940** triggers a temporary record save to the first server front end database **140** on the first server front end **135**. Data included in this temporary record save includes the image data **115**, the image details **120**, and recipient end-use-device data **125**. After the temporary record save to the first server front end database **140** located on the first server front end **135** is completed, an e-mail **1005** as shown in FIG. 10 is sent to the first server back end database **155** located on the first server back end **150**. The e-mail **1005** contains a subject line **1010** containing, for example, "New Information for Victim" or "New Information for Suspect" according to the particular case type selected in the image detail list **930.** The data from the detail list **930** is placed in the body of the e-mail **1005** as image detail list **1015** of FIG. 10. The image data **115** is sent with the e-mail **1005** as an attachment. The recipient information **1020** containing the recipient end-use-device data **125**, username **810**, and tracking ID **910** are also listed in the body of the e-mail **1005**.

After the user **102** clicks the submit button **940** in step **350**, the subroutine advances to step **355** where a confirmation page is displayed after the temporary record has been successfully saved to the first server front end database **140**. This does not verify that the e-mail **1005** to the internal server has been sent successfully.

The aforementioned image data **115**, the image details **120**, and recipient end-use-device data 125 preferably will remain in the first server front end database **140** until an e-mail **1005** transmission confirmation has been returned to the first server front end **135**. From step **355** subroutine **210** continues to step **360** and returns to subroutine **220**, of FIG. 2.

Image and Data Uploaded to the First Server Via E-mail

Turning now to FIG. 3B, describing the exemplary subroutine **210'** from FIG. 2 in which the user **102** uploads the image data **115**, image details **120** and recipient end-use-device data **125** to the first server **130** via e-mail. Subroutine **210'** begins at starting block **305'** and advances to step **310'** where the user **102** initiates a data consolidating programming module on user computer **105**. This programming module, through user input, creates the e-mail **1005**. Unlike subroutine **210**, subroutine **210'** provides for the creation of the e-mail **1005** through the use of the data consolidating programming module executed on user computer **105** and not through the use of a web page.

After the user **102** initiates the data consolidating programming module on user computer **105** in step **310'**, subroutine **210'** advances to step **325'** where the user **102** designates the image data **115**. The image data **115** can be in a variety of different file formats. For example, such formats and corresponding file extensions can comprise one of the following: tagged image file format (.tif), graphics interchange format (.gif), joint photographic experts group format (.jpg), and bit map format (.bmp). However, embodiments of the present invention envision that any other file format for graphic images will suffice.

From step **325'**, subroutine **210'** advances to step **330'** where the user **102** enters image details **120**. Again, image details **120** in the present embodiment may include: suspect or victim, first name, last name, date of birth, hair color, place of birth, eye color, height, complexion, weight, sex, build, race, occupation(s), nationality, scars and marks, and comments. Those skilled in the art will appreciate that other details may accompany an image. The data consolidating programming module may use

fields that have drop-down selection lists with standard values while others are free-form text fields. For example, if the user **102** clicks on the hair color field, a list of various hair colors will appear. The user **102** need only click on the desired color to enter the data rather than typing a word into the field. If the desired color is not included in the drop-down list, the user **102** may enter the color by typing a word into the field.

Once the user **102** enters image details **120** in step **330'**, subroutine **210'** advances from step **330'** to decision block **335'**. At decision block **335'** it is determined if the user **102** wishes to send the image to selected recipient end-use-devices. If the user **102** wishes to send to selected recipient end-use-devices, subroutine **210'** advances to step **340'** where the user **102** enters recipient end-use-device data **125**. This is done by selecting recipient end-use-device users from a pre-filled drop-down list of the data consolidating programming module. The user **102** may select multiple individual end-use-devices from this list. From step **340'**, subroutine **210'** advances to step **350'**.

If at decision block **335'** it was determined, however, that the user **102** does not wish to send the image to selected recipient end-use-devices, subroutine **210'** advances to step **345'**. At step **345'** the user **102** enters recipient end-use-device data **125** as region data including the city and state of the broadcast as well as a radius from the city center establishing the broadcast limit. From step **345'**, subroutine **210'** advances to step **350'**.

At step **350'** of subroutine **210'**, the user **102** initiate a data transmission from the user computer **105** to the SMTP server **170** by clicking a submit button. In this transmission, the image data **115** is sent in the e-mail **1005** as an attachment. The recipient end-use-device data **125**, username **810**, and tracking ID **910** are listed in the body of the e-mail **1005**.

After the user **102** initiate the data transmission from the user computer **105** to the SMTP server **170** in step **350'**, the subroutine advances to step **355'** where the SMTP server **170** in turn sends the e-mail **1005** to the first server back end **150**. The first server back end **150** then sends the e-mail **1005** to the first server back end

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database **155**. From step **355'** subroutine **210'** continues to step **360'** and returns to subroutine **220**, of FIG. 2.

First Server Converts and Sends Image and Data to Second Server

Turning now to FIG. 4, describing the exemplary subroutine **220** from FIG. 2 in which the first server 130 converts and breaks the data into blocks, the blocks are sent as multiple e-mails to the second server **160**. Subroutine **220** begins at starting block **405** and advances to step **410** where the e-mail **1005** is received by the first server back end database **155**. Once the e-mail **1005** is received, the subroutine advances to step **415** where the image data **115** is detached from the e-mail **1005** and saved. Detached image files are stored in the same format in which they were received and are re-named as the tracking ID **910** followed by the appropriate file extension for the format. For example, such formats and corresponding file extensions can comprise one of the following: tagged image file format (.tif), graphics interchange format (.gif), joint photographic experts group format (.jpg), and bit map format (.bmp).

From step **415**, subroutine **220** advances to step **420** where the image detail list **1015** from the e-mail **1005** body is copied to a details text file **1105**. The details text file **1105**, as shown if FIG. 11, is typically saved in the first server back end database **155** with a name comprising the tracking ID **910** followed by ".txt". The ".txt" extension signifies that the file is a text file. The recipient information **1020** containing the recipient end-use-device data **125**, username **810**, and tracking ID **910** are also copied to the details text file **1105**.

Once the data is copied in step 420, subroutine 220 advances from step 420 to decision block 425. At decision block 425 it is determined if the user entered region data in the recipient information 1020. If the user did not enter region data in the recipient information 1020, subroutine 220 continues to step 435 where the image data 115 is converted to the bitmap format. If the user entered region data in the recipient information 1020, subroutine 220 continues to step 430, where recipients are determined using the region data. In order to accomplish this, the city, state, and radius are read from the details text file 1105. The city, state, and radius are used to determine the ten digit zip code corresponding to the center of the city in question. The

zip code is then converted into a latitude and longitude pair, which are then used in a proximity search, along with the radius given, to find all possible geocodes within the radius. This list of geocodes is then matched to a data base containing end-use-device users and their associated city, state, geocode, and address. The addresses corresponding to the identified geographic area are then added as the recipient end-use-device data in the details text file 1105.

If the user did not enter region data in the recipient information 1020, or from step 430, subroutine 220 advances to step 435 where the image data 115 is converted to the bitmap format. At step 435 the image data 115 saved according to its tracking ID 910 is preferably converted from its original format to an 8-bit grayscale bitmap format. In addition, the image is typically resized to a height of 115 pixels or a max width of 100 pixels and saved in the bitmap format. The saved file name of the image data 115 is the tracking ID 910 followed by ".bmp" which designating the file as a bitmap formatted file.

From step **435**, subroutine **220** advances to step **440** where the image data **115** is converted to a supported image file format that is supported by the end-use-device **188**. For example, if a Motorola 2000x pager supplied by Motorola, Inc., of Schaumburg, IL is utilized as the end-use-device **188**, the ".rob" format may be used. The ".rob" format is a proprietary file format of Motorola, Inc. and is currently the only image format that is supported by the Motorola 2000x pager. In this case, image data **115** is converted from the bitmap format to the ".rob" format using an executable file supplied by Motorola, Inc. Once converted, the image data **115** is saved in the first server back end data base **155** with a ".rob" extension. The file name is the tracking ID **910** followed by ".rob".

From step **440**, subroutine **220** advances to step **445** where the image data **115**, now in the supported image file format, is preferably converted to the UUencoded format. The traditional UUencode headers and footers are removed from this file. UUencoding is a common method for transmitting non-text files via Internet e-mail, because the Internet was originally designed only for ASCII text. A UUencode utility encodes a file by converting 8-bit characters into 7-bit ASCII text, and a UUdecode utility decodes the file back to the original format at the receiving end. Originating in the

UNIX community, UUcoding was one of the first methods for sending binary files as attached files via Internet e-mail.

From step **445**, subroutine **220** advances to step **450** where the image data **115** containing the image data and the details text file **1105** of FIG. 11 are merged into a raw UUencoded file **1205** as shown if FIG. 12. This file contains a traditional UUencoded header **1210**, traditional UUencoded footer **1215**, UUencoded image file data **1220**, and details text file data **1225**. After the raw UUencoded file **1205** is created in step **450**, the subroutine continues to step **455** where the raw UUencoded file **1205** is used to create a modified UUencoded text file **1305** as shown in FIG. 13. Because the end-use-device **188** may be limited to a maximum size file it can receive, the data contained in the raw UUencoded file **1205** is divided into blocks as it is placed in the modified UUencoded text file **1305**. For example, the file size limit may be 2000 characters. The total number of blocks **1310** need to be sent to the end-use-device **188** is determined and placed in the modified UUencoded text file **1305**. Next at this step, the text of the raw UUencoded file **1205** is split into a plurality blocks equal to the total number of blocks **1310** determined previously. In FIG. 13, a typical block **1312** is shown. Prior to the block **1312** is the header **1315** corresponding to the block which follows a separator **1320** indicating the end of the block. Recipient list **1330** indicating the e-mail address of the recipient end-use-devices is derived from the recipient data and placed in the modified UUencoded text file **1305**. Pipes are preferably added to the end of each line to ensure that no characters are cut off when the data is transmitted to the end-use-device **188**. An exemplary pipe **1325** is shown in FIG. 13.

From step **455**, subroutine **220** advances to step **460** where mail messages are created corresponding to each text block in the modified UUencoded text file **1305**. The addresses for the each e-mail is obtained from the recipient list **1330** contained in the modified UUencoded text file **1305**.

From step **460**, subroutine **220** advances to step **465** where the e-mail messages created in step **460** are sent. The e-mails are sent in numerical order with a short delay between each transmission. The header of each text block determines this order. For example, in a series of five blocks, the following header tags are in

numerical order: 15, 25, 35, 45, 55, wherein 15 indicates 1 of 5, 25 indicates 2 of 5, and so forth. An exemplary header tag **1335** containing 55 is shown in FIG. 13. From step **465,** the subroutine continues to step **470** and returns to subroutine **230**, FIG.2.

Second Server Sends Multiple E-mails to the End-use-device

Turning now to FIG. 5, describing the exemplary subroutine **230** from FIG. 5 in which the second server **160** sends the multiple e-mails to the end-use-device **188** over the wireless network **187**. Subroutine **230** begins at starting block **505** and advances to step **510** where the second server **160** receives the e-mails sent in step **465** of subroutine **220**. The second server **160** is operated by a provider of wireless e-mail services. Those skilled in the art will appreciate that many wireless e-mail service providers are available.

Once the second server **160** receives the e-mails, subroutine **230** advances to step **515** where the e-mails are sent through a wireless network **187** to the end-use-device **188** corresponding to the addressee of the e-mails. In the present invention, wireless is defined as radio transmission via the airwaves. Those skilled in the art will appreciate that various other communication techniques can be used to provide wireless transmission including infrared line of sight, cellular, microwave, satellite, packet radio and spread spectrum radio. The end-use-device **188** in this case can be any mobile terminal such as a smart phone, personal digital assistant, intelligent pager, portable computer, hand held computer, or any device capable of receiving wireless data. Wireless data may include, but is not limited to, paging, text messaging, e-mail, Internet access and other specialized data applications specifically excluding voice transmission. A personal digital assistant (PDA) is a handheld computer that serves as an organizer for personal information. It generally includes at least a name and address database, to-do list and note taker. PDAs are typically pen based and use a stylus to tap selections on menus and to enter printed characters. The unit may also include a small on-screen keyboard which is tapped with the pen. Data may be synchronized between the PDA and a desktop computer through a cable or wireless transmissions.

From step **515,** the subroutine **230** continues to step **520** and returns to subroutine **240** of FIG. 2.

End-use-device Converts the E-mails and Displays the Image

Turning now to FIG. 6, describing the exemplary subroutine **240** from FIG. 6 is further described where the end-use-device **188** converts the e-mails into the image and displays the image. In an example, referring to FIG. 14, a Motorola PAGEWRITER 2000X **1405** is displayed. In the embodiment, the PAGEWRITER 2000X **1405** is employed as the end-use-device **188**. Those skilled in the art, however, will appreciate that other end-use-devices may be used including, but not limited to, the devices discussed with respect to step **520** of subroutine **230**. The PAGEWRITER 2000X **1405** allows end-use-device users to send messages back and forth to each other. In addition, it can send and receive e-mail and faxes and can be programmed to retrieve information from the Internet. This device comprises a keyboard **1410** and a display **1415**. The dimensions of the PAGEWRITER 2000X **1405** are 3.75" x 2.85" x 1.2" and it weighs 6.7 oz. The memory comprises 4MB of flash memory and 512 kB of RAM for a total of 4.5 MB of memory. The display **1415** is 9 lines by 27 characters with 240 x 160 pixels. It is power by a NiMH rechargeable battery. Additional information on the PAGEWRITER 2000X **1405** can be obtained from Motorola.

Subroutine **240** begins at starting block **605** and advances to step **610** where the e-mails addressed to the end-use-device **188** are received. FIG. 15 shows an incoming image received prompt **1505** that is displayed once for each e-mail received. The user clicks on the OK button **1510** to advance to the next step. After the end-use-device user **190** clicks the OK button **1510** on the incoming image received prompt **1505**, subroutine **240** advances from step **610** to step **620** where the plurality of e-mails are reconstructed into the image data **115**. At this step, a programming module within the end-use-device **188** receives the plurality of e-mails which contain blocks of ASCII characters. Using the headers contained in the e-mails, the programming module joins or, more specifically stated, concatenates the data contained in the plurality of e-mails

in the order specified in the header as previously discussed. The image details **120** likewise are extracted from the plurality of e-mails.

From step **620**, subroutine **240** continues to step **630** where the image data **115** is converted to a displayable format. At this step, a programming module within the end-use-device **188** receives the image data **115**. This module decodes the ASCII image data within the image data **115** into a binary image that can be displayed on the end-use-device **188**. In the present embodiment, the programming module is a UUdecode algorithm specifically designed for the end-use-device **188**. During this process, the decoding message bar **1605** of FIG. 16 informs the end-use-device user **190** of a percentage of the image left to reconstruct.

Once the image is converted to a displayable format in step **630**, the subroutine advances to step **640** where a prompt is displayed informing the end-use-device user **190** that the image is received and prompting the end-use-device user **190** to click on the OK button **1705** to display the image as show in FIG. 17. After the OK button **1705** is clicked, the subroutine advances to step **650** where the image is displayed on the end-use-device **188**. Image details **120** may also be displayed. From step **650,** the subroutine **240** continues to step **660** and returns to step **250** of FIG. 2.

<u>Alternative Embodiment of the Present Invention</u>

An alternative embodiment of the present invention provides for the sending of data contained in the image data **115** and the image details **120** from a user computer **105'** to an end-use-device **188**. Referring now to FIG. 18 and in contrast with the preferred embodiment, the user computer **105'** of this alternative embodiment carries out the functionality of the first server **130** and the user computer **105** of the preferred embodiment. This embodiment of the present invention comprises the user computer **105'** operated by a user **102**, a second server **160**, a wireless network **187,** and an end-use-device **188** designated by the recipient end-use-device data **125** and operated by an end-use-device user **190**. The function of the second server **160** is to provide an interface to the wireless network **187**.

An exemplary method **200'** illustrates how the user **102** converts data contained in the image data **115**, image details **120** and recipient end-use-device data **125,** and sends the data in multiple e-mails to the second server **160**. Turning now to FIG. 19, method **200'** begins at starting block **1905** and advances to step **1910** where the user **102** connects to the internet **110** via a standard internet browser. Preferred methods of the present invention utilize a user computer **105'**, as described previously with respect to the preferred embodiment of the invention.

From step 1910, method 200 advances to step 1915 where the image data 115 is typically converted at the user computer 105' from its original format to an 8-bit grayscale bitmap format. In addition, the image is usually resized to a height of 115 pixels or a max width of 100 pixels and saved in the bitmap format.

From step 1915, method 200' advances to step 1920 where the image data 115 is converted to a supported image file format that is supported by the end-use-device 188. Similar to the preferred embodiment, if a Motorola PAGEWRITER 2000X pager supplied by Motorola, Inc., of Schaumburg, IL is utilized as the end-use-device 188, the ".rob" format may be used. The ".rob" format is a proprietary image format that is supported by the Motorola PAGEWRITER 2000X pager. In this case, image data 115 is converted from the bitmap format to the ".rob" format using an executable file supplied by Motorola, Inc.

From step **1920**, method **200'** advances to step **1925** where the image data **115**, now in the supported image file format, is converted at the user computer **105'** to the UUencoded format. The traditional UUencode headers and footers are removed from this file. A UUencode utility encodes a file by converting 8-bit characters into 7-bit ASCII text, and a UUdecode utility decodes the file back to the original format at the receiving end.

From step **1925**, method **200'** advances to step **1930** where the image data **115** containing the image data and the details text file **1105** of FIG. 11 are merged into a raw UUencoded file **1205** as shown if FIG. 12. This file contains a traditional UUencoded header **1210**, traditional UUencoded footer **1215**, UUencoded image file data **1220**, and details text file data **1225**.

After the raw UUencoded file **1205** is created in step **1930**, the subroutine continues to step **1935** where the raw UUencoded file **1205** is used to create a modified UUencoded text file **1305** as shown in FIG. 13. Because the end-use-device **188** may be limited to a maximum size file it can receive, the data contained in the raw UUencoded file **1205** is usually divided into blocks as it is placed in the modified UUencoded text file **1305**. For example, the file size limit may be 2000 characters. The total number of blocks **1310** need to be sent to the end-use-device **188** is determined and placed in the modified UUencoded text file **1305**. Next at this step, the text of the raw UUencoded file **1205** is split into a plurality blocks equal to the total number of blocks **1310** determined previously. In FIG. 13, a typical block **1312** is shown. Prior to the block **1312** is the header **1315** corresponding to the block which follows a separator **1320** indicating the end of the block. Recipient list **1330** indicating the e-mail address of the recipient end-use-devices is derived from the recipient data and placed in the modified UUencoded text file **1305**. Pipes are preferably added to the end of each line to ensure that no characters are cut off when the data is transmitted to the end-use-device **188**. An exemplary pipe **1325** is shown in FIG. 13.

From step **1935**, method **200'** advances to step **1940** where mail messages are created at the user computer **105'** corresponding to each text block in the modified UUencoded text file **1305**. The addresses for the each e-mail is obtained from the recipient list **1330** contained in the modified UUencoded text file **1305**.

From step **1940**, method **200'** advances to step **1945** where the e-mail messages created in step **1940** are sent from the user computer **105'** to the second server **160** via the Internet **110**. The e-mails are sent in numerical order with a short delay between each transmission. The header of each text block determines this order. For example, in a series of five blocks, the following header tags are in numerical order: 15, 25, 35, 45, 55, wherein 15 indicates 1 of 5, 25 indicates 2 of 5, and so forth. An exemplary header tag **1335** containing 55 is shown in FIG. 13.

Exemplary method **200'** continues to subroutine **1950,** where the second server **160** receives the e-mail messages and sends them to the end-use-device **188** over a wireless network **187**. The steps of subroutine **1950** are shown in FIG. 20 and will be

described in greater detail below. From subroutine **1950,** method **200'** continues to subroutine **1955** where the end-use-device **188** receives the e-mails, converts them into the image and displays the image. The steps of subroutine **1955** are shown in FIG. 21 and will be described in greater detail below. From subroutine **1955,** exemplary method **200'** ends at step **1960**.

An exemplary subroutine **1950** from FIG. 19 illustrates how the second server **160** receives the e-mail messages and sends them to the end-use-device **188** over a wireless network **187** in FIG. 20. Turning now to FIG. 20, subroutine **1950** begins at starting block **2005** and advances to step **2010** where the second server **160** receives the e-mails previously sent. The second server **160** is operated by a provider of wireless e-mail services. Those skilled in the art will appreciate that many wireless e-mail service providers are available.

Once the second server **160** receives the e-mails, subroutine **1950** advances to step **2015** where the e-mails are in turned sent through a wireless network **187** to the end-use-device **188** corresponding to the addressee of the e-mail. As stated previously, wireless is defined as radio transmission via the airwaves. Those skilled in the art will appreciate that various other communication techniques can be used to provide wireless transmission including, but not limited to, infrared line of sight, cellular, microwave, satellite, packet radio and spread spectrum radio. The end-use-device **188** in this case can be any mobile terminal such as a smart phone, personal digital assistant, intelligent pager, portable computer, hand held computer, or any device capable of receiving wireless data. Wireless data may include but is not limited to paging, text messaging, e-mail, Internet access and other specialized data applications specifically excluding voice transmission. From step **2015,** the subroutine **1950** continues to step **2020** and returns to subroutine **1955** of FIG. 19.

The exemplary subroutine **1955** from FIG. 19 is described in more detail below where the end-use-device **188** receives the e-mails, converts them into the image and displays the image. Referring now to FIG. 21, subroutine **1955** begins at starting block **2105** and advances to step **2110** where the e-mails addressed to the end-use-device **188** are received. For example, FIG. 15 shows an incoming image received prompt **1505** that is displayed once for each e-mail received. The user clicks on the OK button

1510 to advance to the next step. After the OK button **1510** is clicked on the incoming image received prompt **1505**, subroutine **1955** advances from step **2110** to step **2120** where the plurality of e-mails are reconstructed into the image data **115**. At this step, a programming module within the end-use-device **188** receives the plurality of e-mails which containing blocks of ASCII characters. Using the headers contained in the e-mails, the programming module joins or concatenates the data contained in the plurality of e-mails in the order specified in the header as previously discussed with respect to the preferred embodiment. The image details **120** likewise are extracted from the plurality of e-mails.

From step **2120**, subroutine **1955** continues to step **2130** where the image data **115** is converted to a displayable format. At this step, a programming module within the end-use-device **188** receives the image data **115**. This module decodes the ASCII image data within the image data **115** into a binary image that can be displayed on the end-use-device **188**. In the present embodiment, the programming module is a unique UUdecode algorithm specifically designed for the end-use-device **188**. During this process, the decoding message bar of FIG. 16 informs the end-use-device user **190** of a percentage of the image left to reconstruct.

Once the image is converted to a displayable format in step **2130**, the subroutine advances to step **2140** where a prompt is displayed informing the end-use-device user **190** that the image is received and prompting the end-use-device user **190** to click on the OK button **1705** to display the image as show in FIG. 17. After the OK button **1705** is clicked, the subroutine advances to step **2150** where the image is displayed on the end-use-device **188**. Image details **120** may also be displayed. From step **2150,** the subroutine **1955** continues to step **2160** and returns to step **1960** of FIG. 19.

In view of the foregoing, it will be appreciated that the present invention provides a method and system for wireless delivery of images. Still, it should be understood that the foregoing relates only to the exemplary embodiments of the present invention, and that numerous changes may be made thereto without departing from the spirit and scope of the invention as defined by the following claims.